



# **The Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**

## **Overview of Guidelines**

**April 26-27, 2005**



**Office of Policy and International Affairs  
U.S. Department of Energy**



## Briefing Outline

- ◆ Background – program, revision process, next steps
- ◆ Overview of Interim Final General Guidelines
- ◆ Draft Emission Inventory Technical Guidelines
- ◆ Draft Emission Reduction Technical Guidelines



## 1605(b) Program Background

- ◆ Established by section 1605(b) of Energy Policy Act of 1992.
- ◆ Flexible implementing guidelines issued 1994.
- ◆ Over 200 regular reporters.
- ◆ Reports on thousands of projects submitted.





On February 14, 2002, the President directed the Secretary of Energy, working with the Secretaries of Commerce and Agriculture, and the Administrator of the Environmental Protection Agency, to propose improvements to the current greenhouse gas registry to

**“...enhance measurement accuracy, reliability and verifiability, working with and taking into account emerging domestic and international approaches.”**

1. Reduce U.S. greenhouse gas emissions intensity 18% by 2012.
2. Improve DOE’s voluntary GHG reporting program.
3. Develop recommendations for protecting real reductions against future climate policy and on giving transferable credits.
4. Challenge businesses to take action (Climate VISION, Climate Leaders).



## Revision Process – Laying the groundwork

- ◆ Established interagency working groups.
- ◆ Issued a public Notice of Inquiry, May 2002.
- ◆ Held workshops; Met with stakeholder groups.
- ◆ Proposed General Guidelines, December 2003.



## Revision Process – 2005 and 2006

- ◆ March 24, 2005: Interim Final General and Draft Technical Guidelines published in Federal Register for comment.
- ◆ April 26/27 and May 5: Public workshops.
- ◆ May 23: Comment period closes **[unless extended]**.
- ◆ September 20: Guidelines become effective [unless extended].
- ◆ Fall 2005: EIA issues forms (after public review).
- ◆ First reports under revised guidelines: Summer 2006.



## Basic Elements of General Guidelines Have Not Changed from December 2003 Proposal

Focus on Registering Reductions, requiring:

- ◆ Entity-wide reporting -- for both inventories and reductions
- ◆ Inventories of all gases and sequestration
- ◆ Post-2002 reductions
- ◆ Reductions derived primarily from emissions intensity and related measures

Small Emitters may limit reports to single *activity*.



## Changes to the General Guidelines since the December 2003 Proposal

- @ **International** emissions and emission reductions can be reported.
- @ **More detailed requirements** for defining reporting entities and preparing Entity Statements, conducting inventories and calculating reductions.
- @ A **quality rating system** has been added for inventories.
- @ The ***de minimis* provision** has been modified to eliminate 10,000 tonnes of CO<sub>2</sub> equivalent maximum.



# Key Elements of Draft Technical Guidelines

- @ Emissions inventory methods for all main sources, with quality ratings.
- @ Reduction calculation methods including:
  - @ Using subentities
  - @ Setting base periods and base values
  - @ Method-specific guidance, including special methods for electricity generators and users

# Framework of Revised Program

**All Reporters: Require Legal Basis for Entity; 'Encourage' Highest Level**

**Small Emitters**

**Large Emitters**

**"Reporting Only" Entities**

**Inventory of Emission  
for Selected Activities**

**Entity-wide Emission Inventory**

**Calculate Reductions at  
any level for any year:  
project; facility; pre-2002,  
etc. (Inventory not  
required)**

**Calculate  
Reductions for  
Relevant Activities,  
e.g., forested land**

**Calculate Reductions  
Across Entire Entity (may include  
sub-entity reductions such as  
plants, facilities, projects)**

***Reported  
Reductions***

**Potential  
Offset**

**Oil and Gas  
Production  
Activities**

**Avoided  
Emissions**

**Forest  
Sequestration  
project**

**Sum**

***Registered Emission Reductions***

**VOLUNTARY  
REPORTING of**



**GREENHOUSE  
GASES**



# Some Crosscutting Issues

- ⌚ Reporting v. registration of emission reductions
- ⌚ Nature of guidelines [reporting remains voluntary]
- ⌚ Effective date of guidelines and start of reporting under revised guidelines
- ⌚ Possible extension of comment period
- ⌚ Relationship to Climate Leaders and Climate VISION



## Why Report?

- ◆ To demonstrate the results of your entity's commitment to reducing greenhouse gas emissions.
- ◆ To establish an official, government record of entity emissions and reductions.
- ◆ To initiate a comprehensive program of greenhouse gas emission monitoring and management.
- ◆ To document emission reductions that might be recognized by future government policies or programs.



# Some Key Issues for Discussion

- @ Inventory methods and quality ratings
- @ Emission reduction methods, including:
  - @ Practicality of methods for assessing entity-wide reductions
  - @ Organizational boundaries and emission reduction “ownership” issues.
  - @ Indirect emission reductions
  - @ Offset emission reductions.



# **Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**

## **Entity Statements and Starting to Report**

**10:45 – 11:30**



**Mark Friedrichs  
Office of Policy and International Affairs  
U.S. Department of Energy**



## Defining and Naming the Entity, and Setting Organizational Boundaries

- ☉ Companies are encouraged to report at highest level of aggregation.
- ☉ Reporting entities must have a legal basis and be named appropriately.
- ☉ Entities that register reductions must define an organizational boundary.
- ☉ Entities should use “financial control” to determine boundary.
- ☉ The same approach should be used to determine non-U.S. boundaries (if any).



## International Emissions and Reductions

- ⌚ Non-U.S. emissions and reductions may be reported, but only if U.S. emissions and reductions are also reported.
- ⌚ The U.S. means the 50 States, D.C., Puerto Rico, and other U.S. territories.
- ⌚ The countries in which economic activities occur must be identified (if included in report), and the activities in each country must be treated as a separate subentity.
- ⌚ In general, all non-U.S. activities must be reported following the same rules applicable to U.S. entities.





## Entity Statements – Basic Requirements for All Reporters

- ☉ Name, Legal Basis and Start Year.
- ☉ Summary description of sources (including de minimis sources) and basis for Organizational Boundary.
- ☉ Names of any parent or holding companies NOT covered in inventory.
- ☉ Names of any large subsidiaries or organizational units covered in inventory.
- ☉ Description of the entity and its primary U.S. economic activities.
- ☉ Description of non-U.S. operations (if included).
- ☉ Certification that jointly-owned sources are not “double-counted.”
- ☉ Significant changes from previous report need to be documented.



## Entity Statements - Additional Requirements for Large and Small Emitters

### @ Large Emitters:

- @ The Start Year is the first year for which a complete inventory is submitted.
- @ Must continue to report as Large Emitter in all future years.

### @ Small Emitters:

- @ Must demonstrate annual emissions  $\leq 10,000$  MMT CO<sub>2</sub>e.
- @ Must use methods specified in the Technical Guidelines or the Simplified Emission Inventory Tool (SEIT).



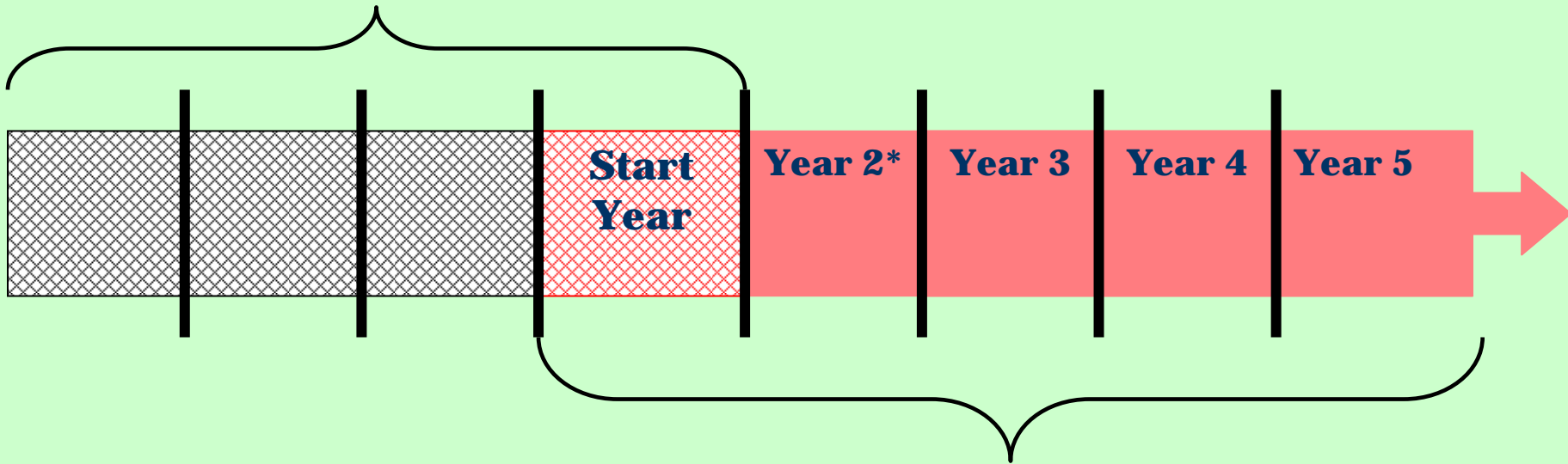
## Offset Entities and Aggregators

- ⌚ A reporting entity or aggregator may register reductions achieved by third parties.
- ⌚ Third parties must meet same requirements as reporters (e.g. large emitters must complete emissions inventory and entity-wide assessment of reductions).
- ⌚ The third party must certify that reporting entity should be recognized as entity responsible for reductions.
- ⌚ Net emission reductions and increases by third party will be included in entity's report, but will remain distinct.



# Determining Start Year, Base Period & First Reduction Year

**Base Periods may be 1-4 years.  
The initial Base Period ends with  
the “Start Year.”**



**The Start Year is the first Reporting Year.  
For registering reductions, the Start Year  
must be 2002 or later.**

**\* Year 2 is the first Reduction Year.**



# **Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**

## **Recordkeeping, Certification, Verification and Process**

**11:30 – 12:00**



**Mark Friedrichs  
Office of Policy and International Affairs  
U.S. Department of Energy**



## Record Keeping, Certification and Other Requirements

- ⌚ Records must be maintained for at least three years.
- ⌚ Trade secret and confidential business information may be protected (5 U.S.C. 552(b)(4)).
- ⌚ All reports submitted to EIA must be certified as:
  - *Accurate and complete*
  - *Compiled in accordance with the Guidelines, and*
  - *Consistent with information submitted in prior years.*
- ⌚ Independent verification is encouraged, but not required.





## Independent Verification

- ⊗ Entities encouraged to have reports independently verified.
- ⊗ Verifiers may not be owned by the reporter, nor provide additional services.
- ⊗ Independent verifiers should have following qualifications:
  - ⊗ *Accredited by independent, nationally-recognized accreditation program(s).*
  - ⊗ *Possess education, training and/or experience matching tasks performed.*
  - ⊗ *Have a professional degree or accreditation in relevant fields, supplemented by training and/or experience in emissions reporting and accounting.*
- ⊗ A few nationally recognized organizations that accredit individual verifiers include, but are not limited to the following:
  - ⊗ *American Institute of Certified Public Accountants*
  - ⊗ *ANSI's Registrar Accreditation Board for Environmental System Auditors*
  - ⊗ *Board of Environmental, Health and Safety Auditor Certifications*
  - ⊗ *California Climate Action Registry*
  - ⊗ *Comparable international bodies*



# EIA Review and Acceptance (or Rejection) of Reports

The Energy Information Administration:

- ⌚ Reviews reports for completeness and internal consistency
- ⌚ Based on this review, EIA intends to accept or reject reports within 6 months.
- ⌚ Emission reductions qualifying for registration will be identified in letter to reporter and in EIA data base and program reports.



# Key Addresses

**All documents, including public comments, plus  
Links to workshop registration:**

- <http://www.pi.energy.gov/enhancingGHGregistry/>

**Send public comments (or questions) to:**

- 1605bGuidelines.Comments@hq.doe.gov



# Draft Comparison of Revised 1605b Guidelines to Climate Leaders

Feature	Revised 1605b guidelines	Climate Leaders
Scope	All U.S. operations, non-U.S. discretionary	All U.S. operations, non-U.S. discretionary
Reporting entities and boundaries defined	Yes	Yes
Annual emission inventories, including	Yes	Yes
• All 6 UNFCCC Gases	Yes	Yes
• Sequestration	Yes	Yes
• Indirect emissions from electricity use	Yes	Yes
Emission inventory methods	Range of methods, with quality ratings & weighted-average quality standard	Selected methods
Entity-wide assessment of changes in emissions	Yes	Yes



## Comparison of Revised 1605b Guidelines to Climate Leaders (continued)

Feature	Revised 1605b	Climate Leaders
Emission (reduction) targets	No	Yes
Registered emission reductions	Yes	No
Progress measured by emissions intensity or absolute emissions	Yes (if reductions caused by declining output excluded)	Yes (based on negotiated target)
Avoided emissions recognized	Yes	Yes, as offset project
Sequestration recognized	Yes	As offset project
Offset reductions	Yes, as entity reports	Yes, as projects
Project reductions	Only if other methods not feasible	As offsets
Certification statement	Explicit	None
Independent verification	Encouraged	Encouraged
Disposition of data and reports	Public (except business confidential data)	Confidential upon request



# Relationship of Revised 1605b and Climate Leaders Programs -- DOE/EPA Objectives

- ⌚ To encourage participation in both programs.
- ⌚ To enable entities that wish to participate in both programs to file single inventory reports and possibly other combined data reports,
  - ⌚ with some additional information requirements for both programs.
- ⌚ To ensure that there are no direct conflicts between program measurement protocols or other requirements.



# **Update on the Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**



**1605b Workshop  
Plenary Session - Inventories  
April 26-7, 2005**

**Raymond Prince  
Office of Policy and International Affairs  
U.S. Department of Energy**



## Basic Elements of General Guidelines Have Not Changed from December 2003 Proposal

Focus on Registering Reductions, requiring:

- ◆ Entity-wide reporting
- ◆ Inventories of all gases and sequestration
- ◆ Post-2002 reductions
- ◆ Reductions derived from emissions intensity and related measures

Small Emitters may limit reports to single *activity*.



## Changes to the General Guidelines since the December 2003 Proposal

- ⌚ International emissions and emission reductions can be reported.
- ⌚ More detailed requirements for defining reporting entities and preparing Entity Statements.
- ⌚ A quality rating system has been added for inventories.
- ⌚ More specific requirements for registered reductions have been included.
- ⌚ The *de minimis* provision has been modified.



# Key Elements of Draft Technical Guidelines

- @ Emissions inventory methods for all main sources, with quality ratings.
- @ Reduction calculation methods including:
  - @ Subentities
  - @ Base periods and base values
  - @ Method-specific guidance, including special methods for electricity generators and users



## Emissions Inventories

- ⌚ Large emitters that register reductions must submit entity-wide inventories annually, including:
  - ⌚ *Direct emissions of all six GHG categories.*
  - ⌚ *Certain indirect emissions, such as purchased electricity.*
  - ⌚ *All sequestration or other changes in carbon stocks.*
- ⌚ Quantity-weighted quality rating of inventory must be 3.0 or more.
- ⌚ May exclude de minimis sources if  $\leq 3\%$  of annual emissions.
- ⌚ Domestic and international emissions must be reported separately.
- ⌚ All reporters must quantify emissions associated with reported reductions.



## International Emissions and Reductions

- ⌚ Non-U.S. emissions and reductions may be reported, but only if U.S. emissions and reductions are also reported.
- ⌚ The U.S. means the 50 States, D.C., Puerto Rico, and other U.S. territories.
- ⌚ The countries in which economic activities occur must be identified (if included in report), and the activities in each country must be treated as a separate subentity.
- ⌚ In general, all non-U.S. activities must be reported following the same rules applicable to U.S. entities.





## Other Gases and Sources

- ⌚ Entities that register reductions must use the measurement and estimation techniques identified in the technical guidelines to report:
  - ⌚ *Direct emissions of the six categories of greenhouse gases identified in the guidelines (and recognized internationally)*
  - ⌚ *Indirect emissions associated with purchase of electricity, steam and hot/chilled water*
  - ⌚ *Sequestration*
- ⌚ Entities MAY report other indirect emissions, but only if they use methods identified in the technical guidelines.
- ⌚ Other gases may only be reported if DOE agrees that the emission meets the definition of greenhouse gases and has established an acceptable measurement or estimation method in its Technical Guidelines.
- ⌚ Reductions of other gases may be registered only if the gases have been added to the list of covered gases included in the General Guidelines.



## Emissions Inventory - The Emissions Rating System

- Reporters must “rate” their emissions measurement and estimation methods.
- The ratings are *ordinal*, with four levels, A, B, C & D (valued 4, 3, 2, 1).
- An “A” rated method = best method available (e.g. Direct Measurement).
- A “D” rated method = least rigorous method (e.g. estimated activity data).
- The weighted average rating must be  $\geq$  to 3.0 to register reductions.
- Reporters must calculate an inventory weighted average rating for each year.





## Emissions Inventory – The Emissions Rating System

- Direct measurements and mass balance approaches generally rated A or B; Inferred measurements generally rated C or D.
- Every source has at least one A rated methodology
- Ratings based on several considerations:
  - Accuracy
  - Reliability
  - Verifiability
  - Practicality



# Emissions Inventory – Components

- Components
  - Anthropogenic Direct Emissions
  - Anthropogenic Indirect Emissions
  - Sequestration

## Definitions

- Direct Emissions: From sources under the control of the reporting entity when the emissions occurred.
- Indirect Emissions: From sources affected, but not under the control, of the reporting entity when the emissions occurred.
- Anthropogenic emissions: Caused by human activity or influence
- Sequestration: Long term removal (or prevention of release) CO<sub>2</sub> from (into) the atmosphere by biological or physical processes.



# Some Key Issues

- ⌚ Inventory methods and quality ratings, especially for non-CO<sub>2</sub> emissions and agricultural/forestry sources
- ⌚ Treatment of sequestration and de minimis emissions
- ⌚ Relationship to WRI and Climate Leaders guidance and Climate Vision
- ⌚ Are there ways to simplify inventory reporting methods; are some methods impractical
- ⌚ Should the same emission coefficient be used for the inventory and for computing reductions
- ⌚ Should entities be required to update all their inventory reports when establishing a new base value or base period.



# **Update on the Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**



**1605b Workshop  
Breakout Session  
Stationary and Mobile Sources  
April 26, 2005**

**Raymond Prince  
Office of Policy and International Affairs  
U.S. Department of Energy**



# Emissions Inventory – Stationary Source Combustion

**The burning of fuel to produce heat or motive power using equipment in a fixed location.**

- Sources include:

- Electric power generation
- District heating (Commercial and Residential)
- Industrial process heating
- Cogeneration, and
- Powering engines for diverse purposes.



- Majority of emissions come from combustion of coal, petroleum, and natural gas.
- Mass balance and stack monitoring both produce accurate results (rated A or B).
- For methane and nitrous oxide, inferred emissions are rated B.





# Emissions Inventory – Mobile Source Combustion

The use of energy to transport people or materials.

- Typical sources include:

- Cars, Trucks and Buses
- Locomotives, Aircraft and Ships, and
- Construction and Farm equipment.



- Emissions include CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and hydrofluorocarbons (HFC).
- Mass balance (rated A) is most frequently used for estimating CO<sub>2</sub> and HFC emissions, while CH<sub>4</sub> and N<sub>2</sub>O emissions are commonly estimated by inference (rated B).



# **Update on the Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**



**1605b Workshop  
Breakout Session  
Industrial Process Emissions  
April 26, 2005**

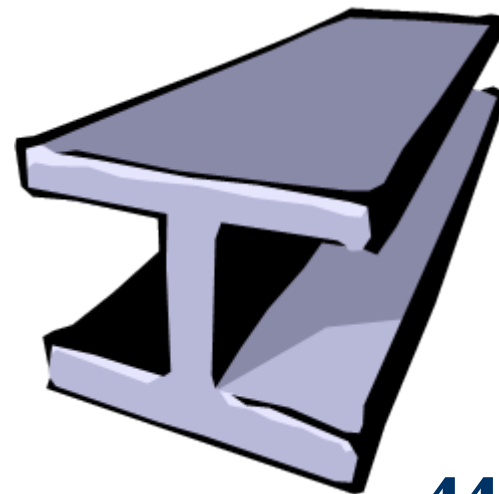
**Lisa Hanle  
Office of Policy and International Affairs  
U.S. Department of Energy**



# Emissions Inventory – Industrial Process Emissions

**“Process emissions” are emissions released during the chemical transformation of materials at some stage of the production process. They are usually the byproduct of a known chemical reaction.**

- Activity sources include manufacture of: adipic acid, aluminum, cement, iron and steel, and lime.
- Other industrial sources (e.g., the use and discharge of gases) and non-production related activities such as maintenance are also covered.
- Emissions include  $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ , HFCs (e.g., HFC-23), perfluorocarbons (PFCs), and  $\text{SF}_6$ .
- Importance of avoiding double counting between stationary combustion and industrial processes.





## Some Key Issues

- ⌚ Inventory methods and quality ratings
- ⌚ Are there ways to simplify inventory reporting methods; are some methods impractical.
- ⌚ Treatment of engineered sequestration and de minimis emissions
- ⌚ Relationship to WRI and Climate Leaders guidance and Climate Vision.
- ⌚ Assignment of responsibility for embedded emissions



# **Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**

## **Emission Inventory Breakout Sessions**

**Mining, Oil and Gas  
Production Emissions  
April 26, 2005**



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Office of Policy and International Affairs  
U.S. Department of Energy**



# Emissions Inventory – Mining, Oil, and Gas Production Emissions

**Methane is principal GHG.**

- Coal mining sources include: Ventilation and degasification in underground mines, surface and post-mining activities, and methane recovery.
- Coal mine emissions are either directly measured or estimated using emission factors.
- Oil and Gas activities emit GHGs during production, processing, transportation, and distribution activities.
- Sources include process emissions, fugitive emissions, and stationary combustion.
- Industry requires a rigorous, site-specific, bottom-up estimate.
- Direct measurement is preferred, although mass balance can be used (particularly for the oil industry).



# Mining, Oil, and Gas Production Emissions

## -- Possible Issues for Discussion

- ❖ Do guidelines adequately recognize/use international and industry-developed protocols?
- ❖ Are methods appropriately rated?
- ❖ Are all important sources addressed? If not, is public review process for adding methods appropriate?



# **Update on the Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**



**1605b Workshop  
Breakout Session  
Waste Treatment and Handling  
April 26-7, 2005**

**Raymond Prince  
Office of Policy and International Affairs  
U.S. Department of Energy**



# Emissions Inventory – Waste Treatment and Handling

- Sources include:

- Landfills
- Domestic and industrial wastewater, and
- Sludge handling.



- Landfills are the single largest source (nearly 26%) of *anthropogenic* methane emissions in the U.S.
- Direct measurement of waste stream is preferred, although IPCC default methods and emission factors are acceptable.



# **Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**

**Emission Inventory  
Breakout Sessions**

**Indirect Emissions**  
**April 26, 2005**



**Mark Friedrichs**  
**Office of Policy and International Affairs**  
**U.S. Department of Energy**



## **Emissions Inventory – Indirect Emissions from Purchased Electricity, Steam, Hot and Chilled Water**

- The only sources of indirect emissions that must be included in inventories are those from with purchased electricity, steam, and hot or chilled water.
- For many reporters, most reportable emissions will be indirect.
- Estimate by calculating the total quantity of energy purchased, then applying an emission factor specified by DOE.
- If dedicated source, measured consumption data used with source-specific emission rates and default transmission loss factor are preferred.
  - Facilities that generate all of their power needs on-site need not report indirect emissions.



## Indirect Emission Coefficients for Electricity End-Use

- ✦ **For emission inventories** = Average emissions intensity of NERC region where demand occurs.
- ✦ **For all emission reduction calculations** = Average emission intensity of U.S. electric sector at point of use



## Indirect Emissions – Possible Issues for Discussion

- Should **inventory** guidelines provide methods for measuring/estimating indirect emissions other than those from purchased energy? Such as....
- When should source-specific emissions of energy generators be used for inventories (or reductions)?
- Is it appropriate to have different indirect emission coefficients for inventories and reductions?



# **Agricultural and Forestry Sources and Sinks**

William Hohenstein  
Global Change  
Program Office

# USDA Contributions to the DOE 1605(b) Guidelines

- Inventory methods for agriculture sources
  - Enteric fermentation
  - Animal waste
  - Rice cultivation
  - Crop residue burning
  - Nutrient and lime applications
- Inventory methods for agricultural soil carbon sequestration
  - COMET model – produces default sequestration rates
  - Protocols for periodic sampling
- Inventory methods for forest and wood products carbon stocks and fluxes
  - Default tables by region, species, management intensity, productivity class
  - Measurement and sampling protocols
  - Guidance on the use of models
  - COLE model – produces default forest carbon sequestration rates
- Methods for estimating reductions from carbon sequestration

# Estimation Method Ratings

(4 Criteria: Accuracy, Reliability, Verifiability, and Practical Application)

Rating	Points	Characterization	Typical Description
A	4	Most Accurate Available	Direct Measurement of actual emissions source; emissions factor based upon repeated direct measurement of source multiplied by measured activity data
B	3	Very Good accuracy	Emissions factor based cluster of direct measurements of source or representative sample multiplied by measured activity data
C	2	Adequate Accuracy	Default emissions factor multiplied by measured activity data; emissions factor based on single measurement multiplied by estimated activity data.
D	1	Better than omitting the source	Default emissions factor multiplied by estimated activity data or static one-time equipment count.

**Entities seeking to register reductions must maintain a weighted average rating of greater than 3.0**

# Special Considerations

## Natural Disturbance:

- Reporters may choose to exclude losses resulting from natural disturbances from their registered reductions. Natural disturbances include:
  - Fire,
  - Pest,
  - Extreme weather, or
  - Disease
- Reporters must continue to track carbon stocks on lands that have experienced disturbances.
- Once carbon stocks have returned to pre-disturbance levels, additional carbon can be registered.

# Special Considerations

## Incidental Lands

- Incidental lands are a minor component of an entity's operations and are not actively managed for production of goods and services (e.g., right of ways).
- Reporters may choose to assume there is no change in carbon stocks on incidental lands as long as they are not converted to other uses during the reporting period.
- Entities must report on the area and type of incidental lands owned and certify that the land use has not changed.

# Special Considerations

## Harvested Wood Products

- Responsibility for sequestration and emissions are assigned to land owner.
  - Users of wood products would not report on emissions from wood products, treating the carbon emissions as biogenic.
- Land owners can either:
  - Use models to estimate and track the changes in wood products carbon pools from lands harvested, reporting the changes in each subsequent year, or
  - Use an estimate of the 100-yr residual carbon stock and count that amount in the year of harvest.



# **Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**



## **Emission Reductions**

**9:00 – 9:45**

**Mark Friedrichs  
Office of Policy and International Affairs  
U.S. Department of Energy**



## Emission Reductions

- ⌚ Registered reductions based on assessment of all changes in emissions relative to Base Period(s).
- ⌚ The Technical Guidelines permit five calculation methods:
  - ⌚ *Emissions Intensity*
  - ⌚ *Absolute Emissions*
  - ⌚ *Changes in Carbon Stocks*
  - ⌚ *Changes in Avoided Emissions*
  - ⌚ *Action-Specific (Project Based)*
- ⌚ Annual increases must be subtracted from future year reductions.





## Emissions Reductions – Choosing Reduction Calculation Method(s)

- ⊕ To calculate reductions reporters must choose the method or methods used to calculate emission reductions.
  - ⊕ For most emissions, choose Emissions Intensity or Absolute Reductions.
  - ⊕ For sequestration, choose Changes in Carbon Stocks.
  - ⊕ For electricity and other energy generators, use Avoided Emissions, or, more than likely, the combined formula specified in guidelines.
  - ⊕ For special situations use Action-Specific (“Project”) Emission Reductions.
- ⊕ Each distinct reduction calculation must be applied to a distinct subentity.



# Emissions Reductions

## – Most entities will have more than subentity

- ⊕ Example: Some business lines may use changes in absolute emissions (if output is flat or increasing), while others may use one or more intensity metrics.
  - ⊕ Acme Corporation
    - ⊕ Subentity A produces widgets – emissions intensity using its widget output
    - ⊕ Subentity B produces multiple products and is growing – Absolute emissions
    - ⊕ Subentity C encompasses managed forest lands – Changes in carbon stock
    - ⊕ Subentity D produces multiple products, but is shrinking – emissions intensity using a economic metric (if feasible), possibly action-specific methods, or possibly no assessment at all.



## Emissions Reductions – Reduction Calculation Method(s)

- ⊕ Emissions and intensity measures must be clearly distinguished and reported separately for each subentity.
- ⊕ An entity's emissions must equal the sum of its subentity emissions (for larger emitters).
- ⊕ Any changes made to a subentity must be documented.
- ⊕ The reporter must specify a Base Period for each method.



## Emissions Reductions – Base Periods

- ⊕ A Base Period is a period of 1-4 years used to derive base emissions, output and base values.
- ⊕ An entity's first year of reported reductions must immediately follow the Start Year.
- ⊕ Two subentities may not use identical output measures unless they have different Base Periods.
- ⊕ To register reductions, the last year of the chosen Base Period must not be earlier than 2002.



## Emissions Reductions – Base Values

- ⊕ Base Values reflect the emissions that occurred during the Base Period.
- ⊕ All reductions are calculated relative to an identified Base Value (e.g., annual emissions or emissions intensity).
- ⊕ Base Values may need to be adjusted to reflect important changes in the entity (e.g., acquisitions or divestitures).
- ⊕ EIA must be notified whenever a Base Period or Base Value is modified or replaced.



## Emissions Reductions – Other Information on Registered Reductions

- ⊕ Reporters must describe the types of actions that led to the reductions.
- ⊕ Reporters must indicate if reductions were the result of plant closings, voluntary actions, or government requirements.
- ⊕ Entities sharing ownership should ensure that “double counting” is avoided.



# Emissions Reductions

## – Some Possible Issues for Discussion

- ✦ Are there ways of simplifying requirements for entity-wide assessments of reductions?
- ✦ Is the role of “subentities” clear?
- ✦ Should more or less flexibility be provided?
- ✦ When is it likely to be infeasible (impractical) to use the identified methods to assess changes in emission reductions?



# **Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**

**Emission Intensity**  
**April 27, 2005**



**Mark Friedrichs**  
**Office of Policy and International Affairs**  
**U.S. Department of Energy**



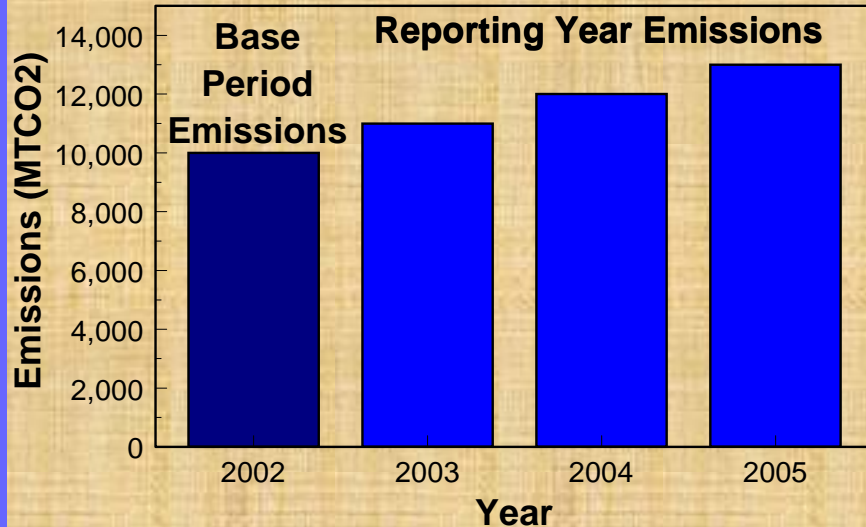
# Emissions Intensity Based Reductions

**Demonstrating emissions intensity-based reductions is important Presidential objective.**

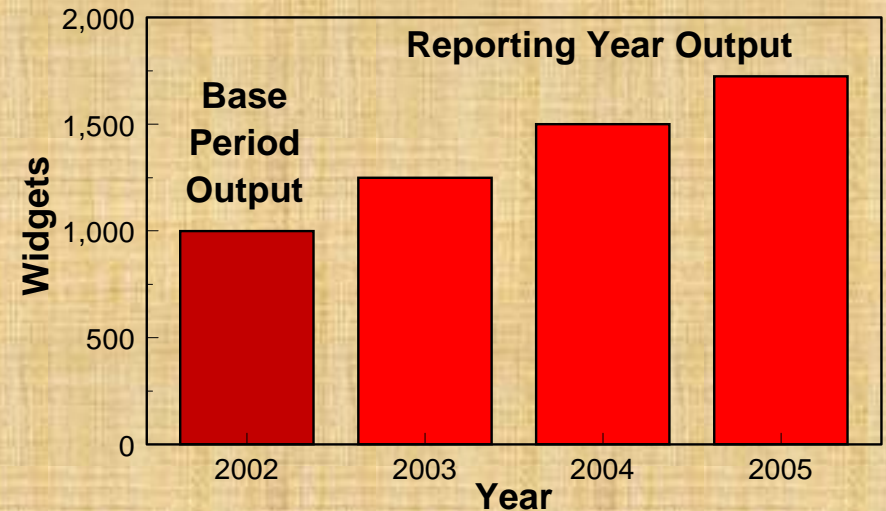
- ✦ Emissions intensity may be the basis for reductions if a reporter has a measure(s) of output that is:
  - ✦ A reasonable indicator of all output of the identified entity/subentity;
  - ✦ A reliable indicator of changes in the reporter's economic activities;
  - ✦ Directly related to emissions levels; and
  - ✦ Any necessary year-to-year adjustments are made (e.g., outsourcing, or changes in products).
- ✦ GHG intensity metrics are generally physical (e.g., tons of steel), but may be economic value (e.g., value of shipments).
- ✦ Changes in GHG emissions are calculated by:
  - ✦ Subtracting the base period GHG intensity from the reporting year GHG intensity, then multiplying the change by output in the reporting year.
  - ✦ 
$$\left[ \left( \frac{E_B}{O_B} \right) - \left( \frac{E_R}{O_R} \right) \right] * O_R = \text{GHG Emission Reduction}$$

# Changes in Emissions Intensity

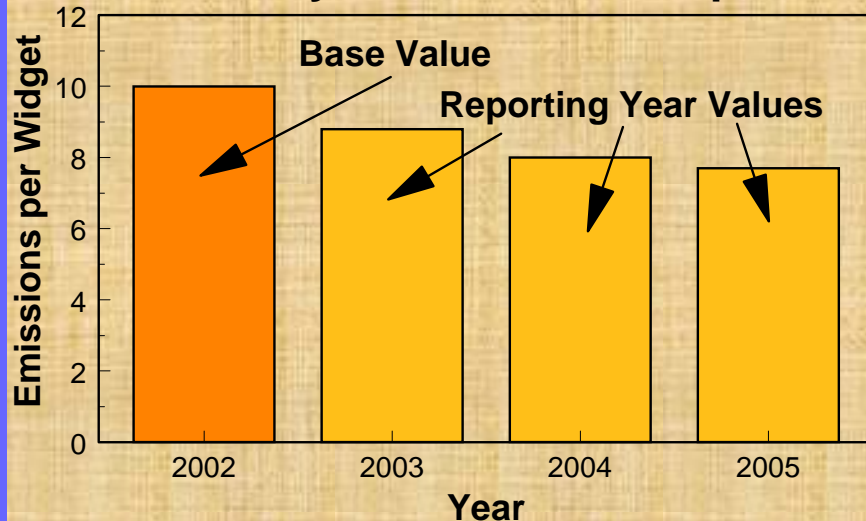
## Emissions



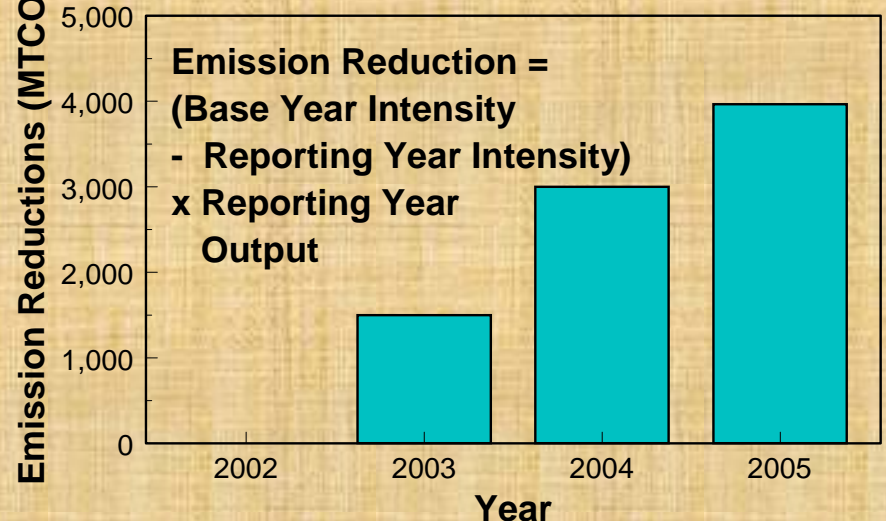
## Output



## Intensity = Emissions/Output



## Emission Reductions



[Return to Main Slide](#)



# Emissions Intensity Based Reductions

- ⊕ The measure of output may be an index.
- ⊕ Measures of “output” may sometimes be “input” quantities, e.g., barrels of crude oil
- ⊕ Each distinct measure of output must be a distinct subentity.
- ⊕ The activities using the same output measure usually must be part of the same subentity.
- ⊕ On- or off-site supporting activities may be integrated with production facilities.



# **Emissions Intensity Based Reductions**

## **-- Possible Issues for Discussion**

- ✦ When are emissions intensity metrics practical to use? When not?
- ✦ Are the intensity guidelines sufficiently flexible? Rigorous?
- ✦ Do emissions intensity methods raise concerns about release of “business confidential data”? Will use of indices help?
- ✦ What economic measures of output are most reliable?





# **Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**

**Absolute  
Emission Reductions**

**11:05 – 12:05**



**Reid Harvey  
U.S. Environmental Protection Agency**

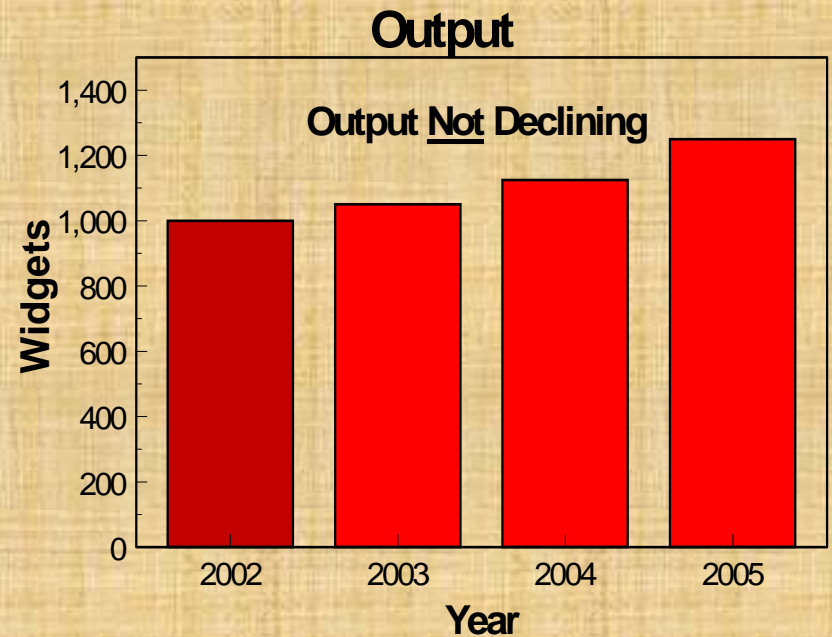
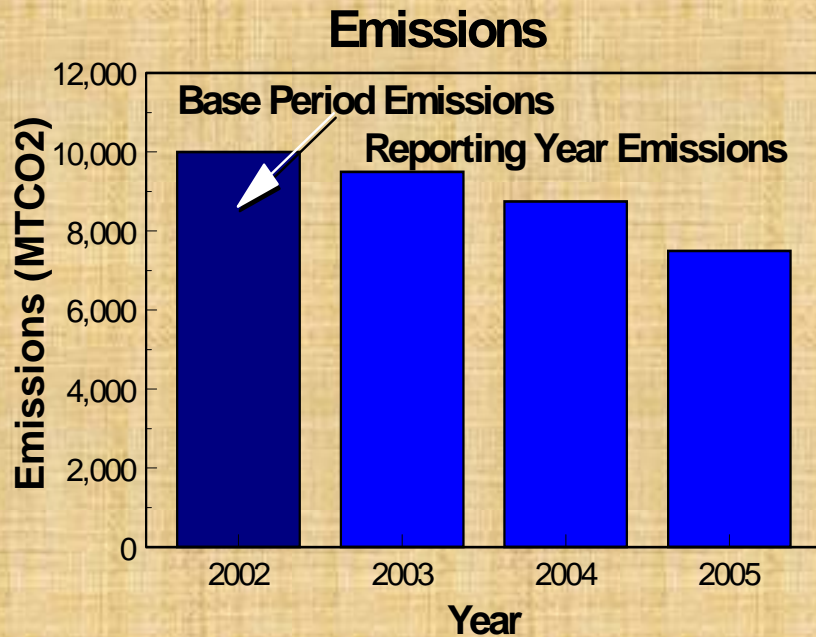


## Absolute Emissions Reductions

- ✦ The reporter must demonstrate that associated output did not decline from the base period to the reporting year.
  - ✦ Reporters may use physical or economic measures of output.
  - ✦ If output declines below base period for one or more years, reports must be filed, but reductions may not be registered
- ✦ Reporters adjust base period emissions (the base value) to reflect acquisitions and divestitures, but not organic growth.
- ✦ Calculating absolute-emissions reductions is straightforward:

$$\underline{AE_B} - \underline{AE_R} = \text{Change in GHG Emissions}$$

# Changes in Absolute Emissions



**Base Value = Base Period Emissions**

**Reporting Year Value = Reporting Year Emissions**

**Emission Reduction =  
Base Year Emissions - Reporting Year Emissions**



## **Absolute Emissions Reductions**

### **-- Possible Issues for Discussion**

- ✦ Will demonstrating output growth be easier than developing intensity metric?
- ✦ Except for output-related restrictions, are requirements the same as Climate Leaders and WRI protocols? Should they be?
- ✦ Should entities be required to establish new base year if there are big changes in type of output?



# **Update on the Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**



**Avoided Emissions, Intensity  
and other Methods  
for Energy Generators  
April 7, 2005**

**Raymond Prince  
Office of Policy and International Affairs  
U.S. Department of Energy**



## Changes in Avoided Emissions

- ⊕ Avoided emissions occur when energy produced by a non- or low-emitting source (e.g., wind) is sold to a customer or network that would have otherwise purchased energy generated by higher-emitting sources (e.g., coal).
- ⊕ This method may be used only if either:
  - ⊕ All of an entity's energy exports were generated by non-emitting sources,  
*OR*
  - ⊕ It had no energy exports during its chosen Base Period (e.g., a new combined cycle gas plant).
- ⊕ These reductions are calculated using the following formula:
  - ⊕  $\text{Reductions}_{\text{Incremental}} = (\text{Benchmark Intensity} - \text{Emissions Intensity}_{\text{Reporting Year}}) * \text{Incremental Generation (MWh or MMBtu)}$





# Avoided Emissions Benchmark Intensity and Emission Coefficients for Electricity End-Use

- **Avoided Emissions Benchmark** = Average emissions intensity of U.S. electric sector at point of generation [ $\sim 0.6$  tons of CO<sub>2</sub> equivalent per Mwh]
  - Approximates average emissions displaced by incremental generation, on average.
- **Emissions Coefficient for Electricity End-Use** [Indirect Emissions]
  - ⊕ For emission inventories = Average emissions intensity of NERC region where demand occurs.
  - ⊕ For all emission reduction calculations = Average emission intensity of U.S. electric sector at point of use



# The Integrated Method for Changes in Avoided Emissions

- ✦ An “Integrated” Method has been provided to simultaneously calculate reductions from Changes in Emissions Intensity and from Changes in Avoided Emissions.
- ✦ This method can be used to calculate reductions associated with energy exports by ALL generators.
- ✦ Most generators will have to choose between the Integrated Method and Changes in Absolute Emissions as the basis for calculating ALL of their reductions associated with energy generation.
- ✦ The Integrated Method is calculated using the following formula:
  - ✦ 
$$\text{Emissions Reductions}_{\text{Reduction Year}} = \text{'Exported' Emissions}_{\text{Base Period}} + [\text{Incremental Generation} * \text{Benchmark}] - \text{'Exported' Emissions}_{\text{Reduction Year}}$$



## Action-Specific (“Project”) Emission Reduction Transmission and Distribution Improvements Example

- ✦ Inefficiencies in the transmission and distribution system result in “losses.”
- ✦ To calculate emission reductions from transmission and distribution losses:
  - ✦ Emissions Reductions<sub>Reduction Year</sub> = [‘Losses’<sub>kWh</sub> \* Emission Factor]<sub>Base Period</sub> - [‘Losses’<sub>kWh</sub> \* Emission Factor]<sub>Reduction Year</sub>
- ✦ DOE requires various documentation to register reductions such as the:
  - ✦ Total estimated number of kilowatt hours (kWh) entering the transmission and distribution system in the base year.
  - ✦ Total estimated number of kWh entering the transmission and distribution system in the current year.
  - ✦ Description of specific actions taken to reduce losses (e.g., high-efficiency transformers, re-conductoring, distribution voltage upgrade).



# Changes in carbon stocks

Jan Lewandrowski  
Global Change  
Program Office

# Absolute increases in carbon stocks can be registered as reductions

Options for Registering Reductions:

- **Changes in emissions intensity**
- **Changes in absolute emissions (if not resulting from declines in output)**
- **Changes in carbon storage**
  - “Registered Reductions” = Annual Carbon Stock Change (if positive)
- **Changes in avoided emissions (resulting from energy sales)**
- **Action-specific emissions reductions (when other methods are not appropriate/feasible)**
- **Reductions associated with “emission-free” energy**

# How does the system ensure that reductions are maintained over time?

- **The system requires continuous reporting.**
- **Once carbon sequestration is registered – the entity must continue to report each year to maintain the registered reductions.**
- **If a registry shows a negative balance (carbon stock losses) the losses are reported in EIA documents and the entity cannot register additional reductions**

# Can land owners receive reductions by shifting practices?

**No,**

- **large entities must provide comprehensive inventories of all greenhouse gas sources and sinks.**
- **Small entities must certify that the actions being reported do not cause an increase in emissions elsewhere under the entities' control.**

# Special Circumstance

## Forest Preservation

- Entities that conserve existing forest carbon stocks can report and register reductions from these actions.
- The land must be placed under:
  - Permanent conservation easements, or
  - Have deed restrictions that limit their use and ensure the conservation of existing carbon stocks.
- Entities can register  $1/100^{\text{th}}$  of the base carbon stocks on those lands plus any incremental carbon stocks gained each year.



# **Department of Energy's Revised Guidelines for Voluntary Reporting of Greenhouse Gases [1605(b)] Program**

**Action-Specific  
[Project] Methods  
April 27, 2005**



**Mark Friedrichs  
Office of Policy and International Affairs  
U.S. Department of Energy**



## Action-Specific (“Project”) Emission Reductions

**Action-specific calculation methods should be used only if none of the other methods is feasible.**

- ⊕ Some of the situations in which action-specific methods might be needed include:
  - ⊕ Emission-intensity methods cannot be used and experiencing declining production
  - ⊕ Special emission-reduction activity (e.g., landfill methane recovery)
  - ⊕ Small emitters reporting on a specific activity
  - ⊕ Reporters not looking to register reductions
- ⊕ Specific actions can be defined as distinct subentities and are derived by comparing the Base Value to the comparable values for the reporting year.





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## Action-Specific (“Project”) Emission Reductions

### - Generic requirements

- ⊕ Each action must identified and described.
- ⊕ Base periods and base values must be identified.
- ⊕ Base values must be either:
  - ⊕ Total emissions from certain identified sources (landfills, coal mines).
  - ⊕ Emissions per unit of output for sources that experience substantial variations in output/utilization.
- ⊕ Base period and reduction year emissions may be estimated, based on documented technology performance.
- ⊕ Continuous monitoring and reporting is required



## Action-Specific (“Project”) Emission Reduction

### Landfill Methane Recovery Example

- ⊕ Landfill gas recovered and combusted through flaring or for energy represents a reduction in methane emissions.
- ⊕ Total flows captured and flared or sold for energy in the base year should be reported as the base value.
- ⊕ DOE requires extensive documentation to register reductions from landfill gas recovery, such as the:
  - ⊕ *Name and location of the landfill or landfills affected.*
  - ⊕ *Estimated volume of waste in place for the landfill(s) affected.*
  - ⊕ *The heat content or percent methane of the gas recovered in the base period.*